Space Weather Forecast

Issued on Sunday, 19 March 2023 at 13:18 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Chance of G1 Minor Storm intervals with Coronal Mass Ejection glance possible day 2 or 3 (20th or 21st) but low confidence. Chance of Moderate flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only common class flares observed, the largest of which was from the relatively simple, but reasonably large and wide sunspot group in the southeast disc. This is one of three sunspot groups in that region, with a small bipolar group to the northeast and unipolar group to the southeast. Two further sunspot groups are on the northeast disc, along with a small region in the southwest giving a total of six regions overall. Significant magnetic looping on the east limb suggests that either further sunspot regions are likely to rotate onto the disc, or further details could become apparent as the current regions move to an easier viewing angle. No Earth-directed coronal mass ejections (CMEs) have been observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind speed was slightly elevated at around 410-480 km/s. The total magnetic field strength was weak with the north-south component Bz also weak and variable. Geomagnetic activity was Quiet to Unsettled (Kp 2-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remains just above background levels after the S1/Minor Solar Radiation Storm that occurred earlier this week. This has been on a gradual overall downward trend, however a very small rise was observed in the last 24 hours. However it remains well below the level required for an S1/Minor Radiation Storm.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is most likely, but with a chance of increasing to Moderate at times with isolated M-flares. These most likely from the regions currently on the southeast disc, or from other regions rotating over the eastern limb.

Solar Wind / Geomagnetic Activity: A glancing CME impact is possible day 2 or early day 3 (20th or 21st) originating from the southwest disc on 17 March, however this is low confidence. This will come alongside a muted connection to a coronal hole fast on day 2 (20th). A stronger coronal hole sourced fast wind connection is expected later in the period. This coronal hole is currently across the southeast quadrant of the Sun, with Earth potentially encountering any solar wind enhancement late on the day 4 (22nd). Mainly Quiet geomagnetic activity is expected day 1 (19th), increasing to Unsettled with Active intervals day 2, before easing again day 3 and 4 (21st) to be mostly Quiet again. Although This perhaps increasing to Active with a slight chance of G1/Minor storms with any CME arrival late on day 2 and continuing day 3. Any solar wind enhancement day 4 is expected increase activity to Active with a chance of G1 Minor Storms.

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to continue very gradually and erratically declining towards background. No other significant enhancements are currently anticipated with solar Radiation storms not expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	20	20	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.